WHAT IS CLAIMED IS:

1. An apparatus for detecting a boundary in a vector sequence representing a signal, said apparatus comprising:

a boundary detection controller capable of detecting a boundary in a vector sequence $\vec{A}(n)$ having an arbitrary dimension by selecting a function to represent a modified first order difference vector of said vector sequence $\vec{A}(n)$, denoted $MFD(\vec{A}(n))$, wherein said function is dependent upon a frequency characteristic of said vector sequence $\vec{A}(n)$;

wherein said boundary detection controller is capable of operating upon said modified first order difference vector $MFD(\vec{A}(n))$ with a length operator to obtain a scalar value $\left\| MFD(\vec{A}(n)) \right\|$ that represents a value of a change in said vector sequence $\vec{A}(n)$ at point n and detecting a local maximum of said scalar value $\left\| MFD(\vec{A}(n)) \right\|$; and

wherein said boundary detection controller is capable of determining whether said local maximum of said scalar value $\left\| MFD(\vec{A}(n)) \right\|$ is larger than a predetermined threshold value.

2. An apparatus for detecting a boundary in a vector sequence representing a signal as set forth in Claim 1 wherein said boundary detection controller is capable of selecting point n as an edge point of $\vec{A}(n)$ when said local maximum of said scalar value $\left\| MFD(\vec{A}(n)) \right\|$ is larger than said predetermined threshold value.

3. An apparatus for detecting a boundary in a vector sequence representing a signal as set forth in Claim 1 wherein said vector sequence $\vec{A}(n)$ is in Euclidean space and said length operator has the form:

$$\left\| \vec{A}(n) \right\| = \sqrt{a_1^2(n)+a_2^2(n)+\cdots+a_p^2(n)}\,.$$

4. An apparatus for detecting a boundary in a vector sequence as claimed in Claim 2 wherein said boundary detection controller is capable of locating a boundary between two neighbor integers, n and n-1, by locating a zero crossing of a difference of a length of said modified first order difference vector for $\vec{A}(n)$, denoted $DLMFD(\vec{A}(n))$, where said difference of a length of said modified first order difference vector is calculated by subtracting an absolute value of said scalar value $\left\| MFD(\vec{A}(n-1)) \right\|$ from an

absolute value of said scalar value $\left\| MFD(\vec{A}(n+1)) \right\|$.

5. An apparatus for detecting a boundary in a vector sequence as claimed in Claim 4 wherein said boundary detection controller is capable of locating said zero crossing of a difference of a length of said modified first order difference vector for $\vec{A}(n)$ by calculating said location of said boundary between said two neighbor integers, n and n-1, using the expression:

$$t_0 = \frac{\left| DLMFD(\vec{A}(n-1)) \right|}{\left| DLMFD(\vec{A}(n-1)) \right| + \left| DLMFD(\vec{A}(n)) \right|} + n - 1$$

where t_0 represents a location of said boundary, and where n represents a value of said integer n, and where $\left| DLMFD\,\vec{A}((n)) \right|$ represents an absolute value of a difference of a length of a modified first order difference of said vector sequence $\vec{A}(n)$ at a location of said integer n, and where $\left| DLMFD\,\vec{A}((n-1)) \right|$ represents an absolute value of a difference of a length of a modified first order difference of said vector sequence $\vec{A}(n)$ at a location of said integer n-1.

6. An apparatus for detecting an edge in a vector space (Y, U, V) of a color image signal as set forth in Claim 1, where Y represents a luminance signal, and where U and V represent chrominance signals, and where said Y, U, and V signals have an equal normalized bandwidth, said apparatus comprising:

a boundary detection controller capable of selecting a function to represent a modified first order difference vector of said vector space (Y, U, V), denoted $f_{YUV}(n)$, wherein said function $f_{YUV}(n)$ is calculated by convolving a low pass filter $L_{YUV}(n)$ with a matrix [-1, 0, 1] representing a first order difference of said vector space (Y, U, V), wherein said low pass filter $L_{YUV}(n)$ has a cut-off frequency equal to said normalized bandwidth for signals Y, U, and V;

wherein said boundary detection controller is capable of operating upon said modified first order difference vector $f_{YUV}(n)$ with a Euclidean length operator to obtain a scalar value $\|f_{YUV}(n)\|$ that represents a value of a change in said vector space (Y, U, V) at point n and detecting a local maximum of said scalar value $\|f_{YUV}(n)\|$; and

wherein said boundary detection controller is capable of determining whether said local maximum of said scalar value

$\|f_{YUV}(n)\|$ is larger than a predetermined threshold value.

7. An apparatus for detecting an edge in a vector space (Y, U, V) as claimed in Claim 6, wherein said boundary detection controller is capable of selecting point n as an edge point of vector space (Y, U, V) when said local maximum of said scalar value $\|f_{YUV}(n)\|$ is larger than said predetermined threshold value.

8. An apparatus for detecting an edge in a vector space (Y, U, V) as claimed in Claim 7, wherein said boundary detection controller is capable of locating a boundary between two neighbor integers, n and n-1, by locating a zero crossing of a difference of a length of said modified first order difference vector for vector space (Y, U, V), denoted $DLf_{YUV}(n)$, where said difference of a length of said modified first order difference vector is calculated by subtracting an absolute value of said scalar value $\|f_{YUV}(n-1)\|$ from an absolute value of said scalar value $\|f_{YUV}(n+1)\|$.

9. An apparatus for detecting an edge in a vector space (Y, U, V) as claimed in Claim 8, wherein said boundary detection controller is capable of locating said zero crossing of a difference of a length of said modified first order difference vector for vector space (Y, U, V) by calculating said location of said boundary between said two neighbor integers, n and n-1, using the expression: $DL\,f_{YUV}(n)$

$$t_0 = \frac{\left|DL\,f_{YUV}\,(n-1)\right|}{\left|DL\,f_{YUV}\,(n-1)\right| + \left|DL\,f_{YUV}\,(n)\right|} + n - 1$$

where t_0 represents a location of said boundary, and where n represents a value of said integer n, and where $\left|DL\,f_{YUV}(n-1)\right|$ represents an absolute value of a difference of a length of a modified first order difference of said vector space (Y, U, V) at a location of said integer n, and where $\left|DL\,f_{YUV}(n-1)\right|$ represents an absolute value of a difference of a length of a modified first order difference of said vector space (Y, U, V) at a location of said integer n-1.

10. An apparatus for detecting an edge in a vector space (Y, U, V) of a color image signal as set forth in Claim 6, where Y represents a luminance signal, and where U and V represent chrominance signals, and where said U and V signals have a smaller normalized bandwidth than a normalized bandwidth of said Y signal, said apparatus comprising:

a boundary detection controller capable of locating a luminance edge in said vector space (Y, U, V) of said color image signal and capable of locating a chrominance edge in said vector space (Y, U, V) of said color image signal;

wherein said boundary detection controller is capable of combining luminance edge information and chrominance edge information to determine said edge in said vector space (Y, U, V) of said color image signal.

11. An apparatus for detecting an edge in a vector space (Y, U, V) of a color image signal as claimed in Claim 10, wherein said boundary detection controller is capable of selecting said luminance edge as said edge in said vector space (Y, U, V) of said color image signal when said chrominance edge is located within two to four pixels of said luminance edge.

12. A method for detecting a boundary in a vector sequence $\vec{A}(n)$ having an arbitrary dimension, said method comprising the steps of:

selecting a function to represent a modified first order difference vector of said vector sequence $\vec{A}(n)$, denoted $MFD(\vec{A}(n))$, wherein said function is dependent upon a frequency characteristic of said vector sequence $\vec{A}(n)$;

operating upon said modified first order difference vector $MFD(\vec{A}(n))$ with a length operator to obtain a scalar value $\left\| MFD(\vec{A}(n)) \right\|$ that represents a value of a change in said vector sequence $\vec{A}(n)$ at point n;

detecting a local maximum of said scalar value $\left\| MFD(\vec{A}(n)) \right\|$; and

determining whether said local maximum of said scalar value $\left\| MFD(\vec{A}(n)) \right\|$ is larger than a predetermined threshold value.

13. A method for detecting a boundary in a vector sequence $\vec{A}(n)$ as claimed in Claim 12, said method further comprising the step of:

selecting point n as an edge point of $\vec{A}(n)$ when said local maximum of said scalar value $\left\| MFD(\vec{A}(n)) \right\|$ is larger than said predetermined threshold value.

14. A method for detecting a boundary in a vector sequence $\vec{A}(n)$ as claimed in Claim 12, wherein said vector sequence $\vec{A}(n)$ is in Euclidean space and said length operator has the form:

$$\left\| \vec{A}(n) \right\| = \sqrt{a_1^2(n)+a_2^2(n)+\cdots+a_p^2(n)} .$$

15. A method for detecting a boundary in a vector sequence $\vec{A}(n)$ as claimed in Claim 13, said method further comprising the step of:

locating a boundary between two neighbor integers, n and n-1, by locating a zero crossing of a difference of a length of said modified first order difference vector for $\vec{A}(n)$, denoted $DLMFD(\vec{A}(n))$, where said difference of a length of said modified first order difference vector is calculated by subtracting an

absolute value of said scalar value $\left\| MFD(\vec{A}(n-1)) \right\|$ from an absolute value of said scalar value $\left\| MFD(\vec{A}(n+1)) \right\|$.

16. A method for detecting a boundary in a vector sequence $\vec{A}(n)$ as claimed in Claim 15, wherein said step of locating a zero crossing of a difference of a length of said modified first order difference vector for $\vec{A}(n)$ further comprises the step of:

calculating said location of said boundary between said two neighbor integers, n and n-1, using the expression:

$$t_0 = \frac{\left| DLMFD(\vec{A}(n-1)) \right|}{\left| DLMFD(\vec{A}(n-1)) \right| + \left| DLMFD(\vec{A}(n)) \right|} + n - 1$$

where t_0 represents a location of said boundary, and where n represents a value of said integer n, and where $\left| DLMFD\,\vec{A}\left((n)\right) \right|$ represents an absolute value of a difference of a length of a modified first order difference of said vector sequence $\vec{A}(n)$ at a location of said integer n, and where $\left| DLMFD\,\vec{A}\left((n-1)\right) \right|$ represents an absolute value of a difference of a length of a modified first order difference of said vector sequence $\vec{A}(n)$ at a location of said integer n-1.

17. A method for detecting an edge in a vector space (Y, U, V) of a color image signal as set forth in Claim 12, where Y represents a luminance signal, and where U and V represent chrominance signals, and where said Y, U, and V signals have an equal normalized bandwidth, said method comprising the steps of:

selecting a function to represent a modified first order difference vector of said vector space (Y, U, V), denoted $f_{YUV}(n)$, wherein said function $f_{YUV}(n)$ is calculated by convolving a low pass filter $L_{YUV}(n)$ with a matrix [-1, 0, 1] representing a first order difference of said vector space (Y, U, V), wherein said low pass filter $L_{YUV}(n)$ has a cut-off frequency equal to said normalized bandwidth for signals Y, U, and V;

operating upon said modified first order difference vector $f_{YUV}(n)$ with a Euclidean length operator to obtain a scalar value $\|f_{YUV}(n)\|$ that represents a value of a change in said vector space (Y, U, V) at point n;

detecting a local maximum of said scalar value $\|f_{YUV}(n)\|$; and

determining whether said local maximum of said scalar value $\|f_{YUV}(n)\|$ is larger than a predetermined threshold value.

18. A method for detecting an edge in a vector space (Y, U, V) as claimed in Claim 17, said method further comprising the step of:

selecting point n as an edge point of vector space (Y, U, V) when said local maximum of said scalar value $\|f_{YUV}(n)\|$ is larger than said predetermined threshold value.

19. A method for detecting an edge in a vector space (Y, U, V) as claimed in Claim 18, said method further comprising the step of:

locating a boundary between two neighbor integers, n and n-1, by locating a zero crossing of a difference of a length of said modified first order difference vector for vector space (Y, U, V), denoted $DLf_{YUV}(n)$, where said difference of a length of said modified first order difference vector is calculated by subtracting an absolute value of said scalar value $\|f_{YUV}(n-1)\|$ from an absolute value of said scalar value $\|f_{YUV}(n+1)\|$.

20. A method for detecting an edge in a vector space (Y, U, V) as claimed in Claim 19, wherein said step of locating a zero crossing of a difference of a length of said modified first order difference vector for vector space (Y, U, V) further comprises the step of:

calculating said location of said boundary between said two neighbor integers, n and n-1, using the expression: $DL\,f_{YUV}(n)$

$$t_0 = \frac{|DL\,f_{YUV}(n-1)|}{|DL\,f_{YUV}(n-1)| + |DL\,f_{YUV}(n)|} + n - 1$$

where t_0 represents a location of said boundary, and where n represents a value of said integer n, and where $|DL\,f_{YUV}(n-1)|$ represents an absolute value of a difference of a length of a modified first order difference of said vector space (Y, U, V) at a location of said integer n, and where $|DL\,f_{YUV}(n-1)|$ represents an absolute value of a difference of a length of a modified first order difference of said vector space (Y, U, V) at a location of said integer n-1.

21. A method for detecting an edge in a vector space (Y, U, V) of a color image signal as set forth in Claim 17, where Y represents a luminance signal, and where U and V represent chrominance signals, and where said U and V signals have a smaller normalized bandwidth than a normalized bandwidth of said Y signal, said method comprising the steps of:

locating a luminance edge in said vector space (Y, U, V) of said color image signal;

locating a chrominance edge in said vector space (Y, U, V) of said color image signal; and

combining luminance edge information and chrominance edge information to determine said edge in said vector space (Y, U, V) of said color image signal.

22. A method for detecting an edge in a vector space (Y, U, V) of a color image signal as claimed in Claim 21, further comprising the step of:

selecting said luminance edge as said edge in said vector space (Y, U, V) of said color image signal when said chrominance edge is located within two to four pixels of said luminance edge.

23. A color image system comprising an apparatus for detecting a boundary in a vector sequence representing a signal, said apparatus comprising:

a boundary detection controller capable of detecting a boundary in a vector sequence $\vec{A}(n)$ having an arbitrary dimension by selecting a function to represent a modified first order difference vector of said vector sequence $\vec{A}(n)$, denoted $MFD(\vec{A}(n))$, wherein said function is dependent upon a frequency characteristic of said vector sequence $\vec{A}(n)$;

wherein said boundary detection controller is capable of operating upon said modified first order difference vector $MFD(\vec{A}(n))$ with a length operator to obtain a scalar value $\left\|MFD(\vec{A}(n))\right\|$ that represents a value of a change in said vector sequence $\vec{A}(n)$ at point n and detecting a local maximum of said scalar value $\left\|MFD(\vec{A}(n))\right\|$; and

wherein said boundary detection controller is capable of determining whether said local maximum of said scalar value $\left\|MFD(\vec{A}(n))\right\|$ is larger than a predetermined threshold value.

24. A color image system comprising an apparatus for detecting a boundary in a vector sequence representing a signal as set forth in Claim 23 wherein said boundary detection controller is capable of selecting point n as an edge point of $\vec{A}(n)$ when said local maximum of said scalar value $\left\| MFD(\vec{A}(n)) \right\|$ is larger than said predetermined threshold value.

25. A color image system comprising an apparatus for detecting a boundary in a vector sequence representing a signal as set forth in Claim 23 wherein said vector sequence $\vec{A}(n)$ is in Euclidean space and said length operator has the form:

$$\left\| \vec{A}(n) \right\| = \sqrt{a_1^2(n)+a_2^2(n)+\cdots+a_p^2(n)} .$$

26. A color image system comprising an apparatus for detecting a boundary in a vector sequence as claimed in Claim 24 wherein said boundary detection controller is capable of locating a boundary between two neighbor integers, n and n-1, by locating a zero crossing of a difference of a length of said modified first order difference vector for $\vec{A}(n)$, denoted $DLMFD(\vec{A}(n))$, where said difference of a length of said modified first order difference vector is calculated by subtracting an absolute value of said

scalar value $\left\| MFD(\vec{A}(n-1)) \right\|$ from an absolute value of said scalar value $\left\| MFD(\vec{A}(n+1)) \right\|$.

27. A color image system comprising an apparatus for detecting a boundary in a vector sequence as claimed in Claim 26 wherein said boundary detection controller is capable of locating said zero crossing of a difference of a length of said modified first order difference vector for $\vec{A}(n)$ by calculating said location of said boundary between said two neighbor integers, n and n-1, using the expression:

$$t_0 = \frac{\left| DLMFD(\vec{A}(n-1)) \right|}{\left| DLMFD(\vec{A}(n-1)) \right| + \left| DLMFD(\vec{A}(n)) \right|} + n - 1$$

where t_0 represents a location of said boundary, and where n represents a value of said integer n, and where $\left| DLMFD\,\vec{A}((n)) \right|$ represents an absolute value of a difference of a length of a modified first order difference of said vector sequence $\vec{A}(n)$ at a location of said integer n, and where $\left| DLMFD\,\vec{A}((n-1)) \right|$ represents an absolute value of a difference of a length of a modified first order difference of said vector sequence $\vec{A}(n)$ at a location of said integer n-1.

28. A color image system comprising an apparatus for detecting an edge in a vector space (Y, U, V) of a color image signal as set forth in Claim 23, where Y represents a luminance signal, and where U and V represent chrominance signals, and where said Y, U, and V signals have an equal normalized bandwidth, said apparatus comprising:

a boundary detection controller capable of selecting a function to represent a modified first order difference vector of said vector space (Y, U, V), denoted $f_{YUV}(n)$, wherein said function $f_{YUV}(n)$ is calculated by convolving a low pass filter $L_{YUV}(n)$ with a matrix [-1, 0, 1] representing a first order difference of said vector space (Y, U, V), wherein said low pass filter $L_{YUV}(n)$ has a cut-off frequency equal to said normalized bandwidth for signals Y, U, and V;

wherein said boundary detection controller is capable of operating upon said modified first order difference vector $f_{YUV}(n)$ with a Euclidean length operator to obtain a scalar value $\|f_{YUV}(n)\|$ that represents a value of a change in said vector space (Y, U, V) at point n and detecting a local maximum of said scalar value $\|f_{YUV}(n)\|$; and

wherein said boundary detection controller is capable of determining whether said local maximum of said scalar value

$\|f_{YUV}(n)\|$ is larger than a predetermined threshold value.

29. A color image system comprising an apparatus for detecting an edge in a vector space (Y, U, V) as claimed in Claim 28, wherein said boundary detection controller is capable of selecting point n as an edge point of vector space (Y, U, V) when said local maximum of said scalar value $\|f_{YUV}(n)\|$ is larger than said predetermined threshold value.

30. A color image system comprising an apparatus for detecting an edge in a vector space (Y, U, V) as claimed in Claim 29, wherein said boundary detection controller is capable of locating a boundary between two neighbor integers, n and n-1, by locating a zero crossing of a difference of a length of said modified first order difference vector for vector space (Y, U, V), denoted $DLf_{YUV}(n)$, where said difference of a length of said modified first order difference vector is calculated by subtracting an absolute value of said scalar value $\|f_{YUV}(n-1)\|$ from an absolute value of said scalar value $\|f_{YUV}(n+1)\|$.

31. A color image system comprising an apparatus for detecting an edge in a vector space (Y, U, V) as claimed in Claim 30, wherein said boundary detection controller is capable of locating said zero crossing of a difference of a length of said modified first order difference vector for vector space (Y, U, V) by calculating said location of said boundary between said two neighbor integers, n and n-1, using the expression: $DL\,f_{YUV}(n)$

$$t_0 = \frac{|DL\,f_{YUV}(n-1)|}{|DL\,f_{YUV}(n-1)| + |DL\,f_{YUV}(n)|} + n - 1$$

where t_0 represents a location of said boundary, and where n represents a value of said integer n, and where $|DL\,f_{YUV}(n-1)|$ represents an absolute value of a difference of a length of a modified first order difference of said vector space (Y, U, V) at a location of said integer n, and where $|DL\,f_{YUV}(n-1)|$ represents an absolute value of a difference of a length of a modified first order difference of said vector space (Y, U, V) at a location of said integer n-1.

32. A color image system comprising an apparatus for detecting an edge in a vector space (Y, U, V) of a color image signal as set forth in Claim 28, where Y represents a luminance signal, and where U and V represent chrominance signals, and where said U and V signals have a smaller normalized bandwidth than a normalized bandwidth of said Y signal, said apparatus comprising:

a boundary detection controller capable of locating a luminance edge in said vector space (Y, U, V) of said color image signal and capable of locating a chrominance edge in said vector space (Y, U, V) of said color image signal;

wherein said boundary detection controller is capable of combining luminance edge information and chrominance edge information to determine said edge in said vector space (Y, U, V) of said color image signal.

33. A color image system comprising an apparatus for detecting an edge in a vector space (Y, U, V) of a color image signal as claimed in Claim 32, wherein said boundary detection controller is capable of selecting said luminance edge as said edge in said vector space (Y, U, V) of said color image signal when said chrominance edge is located within two to four pixels of said luminance edge.

34. Computer-executable instructions stored on a computer-readable storage medium for detecting a boundary in a vector sequence $\vec{A}(n)$ having an arbitrary dimension, the computer-executable instructions comprising the steps of:

selecting a function to represent a modified first order difference vector of said vector sequence $\vec{A}(n)$, denoted $MFD(\vec{A}(n))$, wherein said function is dependent upon a frequency characteristic of said vector sequence $\vec{A}(n)$;

operating upon said modified first order difference vector $MFD(\vec{A}(n))$ with a length operator to obtain a scalar value $\left\| MFD(\vec{A}(n)) \right\|$ that represents a value of a change in said vector sequence $\vec{A}(n)$ at point n;

detecting a local maximum of said scalar value $\left\| MFD(\vec{A}(n)) \right\|$; and

determining whether said local maximum of said scalar value $\left\| MFD(\vec{A}(n)) \right\|$ is larger than a predetermined threshold value.

35. The computer-executable instructions stored on a computer-readable storage medium as claimed in Claim 34 further comprising the step of:

selecting point n as an edge point of $\vec{A}(n)$ when said local maximum of said scalar value $\left\| MFD(\vec{A}(n)) \right\|$ is larger than said predetermined threshold value.

36. The computer-executable instructions stored on a computer-readable storage medium as claimed in Claim 34, wherein said vector sequence $\vec{A}(n)$ is in Euclidean space and said length operator has the form:

$$\left\| \vec{A}(n) \right\| = \sqrt{a_1^2(n) + a_2^2(n) + \cdots + a_p^2(n)} \, .$$

37. The computer-executable instructions stored on a computer-readable storage medium as claimed in Claim 35 further comprising the step of:

locating a boundary between two neighbor integers, n and n-1, by locating a zero crossing of a difference of a length of said modified first order difference vector for $\vec{A}(n)$, denoted $DLMFD(\vec{A}(n))$, where said difference of a length of said modified first order difference vector is calculated by subtracting an

absolute value of said scalar value $\left\| MFD(\vec{A}(n-1)) \right\|$ from an absolute value of said scalar value $\left\| MFD(\vec{A}(n+1)) \right\|$.

38. The computer-executable instructions stored on a computer-readable storage medium as claimed in Claim 37, wherein said step of locating a zero crossing of a difference of a length of said modified first order difference vector for $\vec{A}(n)$ further comprises the step of:

calculating said location of said boundary between said two neighbor integers, n and n-1, using the expression:

$$t_0 = \frac{\left| DLMFD(\vec{A}(n-1)) \right|}{\left| DLMFD(\vec{A}(n-1)) \right| + \left| DLMFD(\vec{A}(n)) \right|} + n - 1$$

where t_0 represents a location of said boundary, and where n represents a value of said integer n, and where $\left| DLMFD\,\vec{A}\big((n)\big) \right|$ represents an absolute value of a difference of a length of a modified first order difference of said vector sequence $\vec{A}(n)$ at a location of said integer n, and where $\left| DLMFD\,\vec{A}\big((n-1)\big) \right|$ represents an absolute value of a difference of a length of a modified first order difference of said vector sequence $\vec{A}(n)$ at a location of said integer n-1.

39. The computer-executable instructions stored on a computer-readable storage medium for detecting an edge in a vector space (Y, U, V) of a color image signal as set forth in Claim 34, where Y represents a luminance signal, and where U and V represent chrominance signals, and where said Y, U, and V signals have an equal normalized bandwidth, the computer-executable instructions comprising the steps of:

selecting a function to represent a modified first order difference vector of said vector space (Y, U, V), denoted $f_{YUV}(n)$, wherein said function $f_{YUV}(n)$ is calculated by convolving a low pass filter $L_{YUV}(n)$ with a matrix [-1, 0, 1] representing a first order difference of said vector space (Y, U, V), wherein said low pass filter $L_{YUV}(n)$ has a cut-off frequency equal to said normalized bandwidth for signals Y, U, and V;

operating upon said modified first order difference vector $f_{YUV}(n)$ with a Euclidean length operator to obtain a scalar value $\|f_{YUV}(n)\|$ that represents a value of a change in said vector space (Y, U, V) at point n;

detecting a local maximum of said scalar value $\|f_{YUV}(n)\|$; and

determining whether said local maximum of said scalar value $\|f_{YUV}(n)\|$ is larger than a predetermined threshold value.

40. The computer-executable instructions stored on a computer-readable storage medium as claimed in Claim 39 further comprising the step of:

selecting point n as an edge point of vector space (Y, U, V) when said local maximum of said scalar value $\|f_{YUV}(n)\|$ is larger than said predetermined threshold value.

41. The computer-executable instructions stored on a computer-readable storage medium as claimed in Claim 40 further comprising the step of:

locating a boundary between two neighbor integers, n and n-1, by locating a zero crossing of a difference of a length of said modified first order difference vector for vector space (Y, U, V), denoted $DLf_{YUV}(n)$, where said difference of a length of said modified first order difference vector is calculated by subtracting an absolute value of said scalar value $\|f_{YUV}(n-1)\|$ from an absolute value of said scalar value $\|f_{YUV}(n+1)\|$.

42. The computer-executable instructions stored on a computer-readable storage medium as claimed in Claim 41 wherein said step of locating a zero crossing of a difference of a length of said modified first order difference vector for vector space (Y, U, V) further comprises the step of:

calculating said location of said boundary between said two neighbor integers, n and n-1, using the expression: $DL\,f_{YUV}(n)$

$$t_0 = \frac{|DL\,f_{YUV}(n-1)|}{|DL\,f_{YUV}(n-1)| + |DL\,f_{YUV}(n)|} + n - 1$$

where t_0 represents a location of said boundary, and where n represents a value of said integer n, and where $|DL\,f_{YUV}(n-1)|$ represents an absolute value of a difference of a length of a modified first order difference of said vector space (Y, U, V) at a location of said integer n, and where $|DL\,f_{YUV}(n-1)|$ represents an absolute value of a difference of a length of a modified first order difference of said vector space (Y, U, V) at a location of said integer n-1.

43. The computer-executable instructions stored on a computer-readable storage medium for detecting an edge in a vector space (Y, U, V) of a color image signal as set forth in Claim 39, where Y represents a luminance signal, and where U and V represent chrominance signals, and where said U and V signals have a smaller normalized bandwidth than a normalized bandwidth of said Y signal, said computer-executable instructions comprising the steps of:

locating a luminance edge in said vector space (Y, U, V) of said color image signal;

locating a chrominance edge in said vector space (Y, U, V) of said color image signal; and

combining luminance edge information and chrominance edge information to determine said edge in said vector space (Y, U, V) of said color image signal.

44. The computer-executable instructions stored on a computer-readable storage medium for detecting an edge in a vector space (Y, U, V) of a color image signal as claimed in Claim 43, further comprising the step of:

selecting said luminance edge as said edge in said vector space (Y, U, V) of said color image signal when said chrominance edge is located within two to four pixels of said luminance edge.